

REMARKS/ARGUMENTS

Claims 20, 22-29, 31, and 33-36 are pending in this application.

Claims 20, 22, 23, 26, 29, 31, 33, and 34 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Ikeda et al. (JP 05-204151) in view of Frechet et al. (U.S. 5,648,196). Claims 24 and 35 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Ikeda et al. in view of Frechet et al., and further in view of Kubota et al. (U.S. 2003/0036020). Claims 25 and 36 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Ikeda et al. in view of Frechet et al., and further in view of Crary (U.S. 3,661,576). Claim 27 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Ikeda et al. in view of Frechet et al., and further in view of Broers et al. (U.S. 4,557,995). Claim 28 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Ikeda et al. in view of Frechet et al., and further in view of Iguchi et al. (U.S. 6,197,480).Z Applicant respectfully traverses the rejections of Claims 20, 22-29, 31 and 33-36.

Claim 20 recites:

A method for forming a thick film pattern, comprising the steps of:
applying to a support a photosensitive paste including a conductive powder, a photosensitive monomer, a photopolymerization initiator, and a polymer, wherein a ratio of the photosensitive monomer to a total amount of the photosensitive monomer and the polymer satisfies the condition represented by the following Formula:

$$\frac{\text{photosensitive monomer}}{\text{photosensitive monomer} + \text{polymer}} \geq 0.86,$$

so as to form a photosensitive paste film;
subjecting the photosensitive paste film to an exposure treatment;
and

developing the photosensitive paste film subjected to the exposure treatment so as to form a thick film pattern; wherein
the contents of the conductive powder, the photosensitive monomer, and the photopolymerization initiator constituting the photosensitive paste are within the following ranges:

conductive powder: about 60 to about 90 percent by weight of the photosensitive paste;

photosensitive monomer: about 5 to about 39 percent by weight of

the photosensitive paste; and
photopolymerization initiator: about 1 to about 10 percent by weight
of the photosensitive paste. (emphasis added)

Applicant's Claim 31 recites features that are similar to the features recited in Applicant's Claim 20, including the above-emphasized features.

The Examiner alleged that Ikeda et al. teaches all of the features recited in Applicant's Claims 20 and 31, except for "the photosensitive paste of the instant application." The Examiner further alleged, "It would have been obvious to use such a paste, based on Ikeda's teachings regarding the amounts of each component of the paste." The Examiner acknowledged that the amount of radical generator/photopolymerization initiator of Ikeda et al. is not within the range of the Applicant's invention. However, the Examiner alleged, "it is well-known in the art that by increasing the amount of photopolymerization initiator, the sensitivity of the photopolymerizable composition increases, as evidenced by Frechet et al. (column 12, lines 15-18 and fig. 2). The amount of photopolymerization initiator in a photopolymerizable composition is a result-effective variable, having influence over the sensitivity of the composition and therefore it may be optimized... It would have been obvious to one of ordinary skill in the art at the time of the invention to increase the amount of radical generator/photopolymerization initiator in the composition of Ikeda et al., in order to increase the sensitivity of the conductive paste."

Regarding the feature of "photosensitive monomer/(photosensitive monomer + polymer) ≥ 0.86 " as recited in Applicant's Claims 20 and 31, the Examiner alleged, "When the photosensitive resin comprises 50 parts binder and 300 parts of polymerizable monomer, the ratio polymerizable monomer/(polymerizable monomer + binder) is approximately 0.86, which meets the limitations of the instant application." Applicant respectfully disagrees.

Paragraph [0029] of the English machine translation of Ikeda et al. discloses:

A rate of binder polymer in a photosensitive resin composition used

for this invention and a polyfunctional radical polymerization nature monomer is important for the pattern formation characteristic of a photopolymerization nature conductive paste constituent. As for each rate, it is desirable that it is in the following range. Binder polymer: 50 weight-section **polyfunctional radical polymerization nature monomer : If a 10 - 300 weight-section polyfunctional radical polymerization nature monomer exceeds 300 weight sections, it will become difficult to maintain viscosity good as a paste composition.** Pattern formation nature in exposure and a developing process worsens, and is not preferred. If a polyfunctional radical polymerization nature monomer will be ten or less weight sections, a soluble difference in a developing process of an exposure part and an unexposed part will decrease, pattern formation nature gets worse, and it is not desirable. **A polyfunctional radical polymerization nature monomer of 30 to 80 weight section is more preferably added to binder polymer 20 to 100 weight section.** (emphasis added)

In other words, Ikeda et al. teaches that the absolute maximum value of the ratio polymerizable monomer/(polymerizable monomer + binder) is 0.857 (300/300+50). Ikeda et al. further teaches that the ratio polymerizable monomer/(polymerizable monomer + binder) is preferably in the range of 0.286 to 0.667 (20/20+50 to 100/100+50), and more preferably in the range of 0.375 to 0.615 (30/30+50 to 80/80+50). In addition, Ikeda et al. specifically teaches that the amount of the polymerizable monomer cannot exceed 300 weight sections, that is, Ikeda et al. specifically teaches away from a ratio polymerizable monomer/(polymerizable monomer + binder) that exceeds 0.857.

Thus, contrary to the Examiner's allegations, not only does Ikeda et al. fail to teach or suggest the feature of "photosensitive monomer/(photosensitive monomer + polymer) ≥ 0.86 " as recited in Applicant's Claims 20 and 31, but also Ikeda et al. actually teaches away from the feature of "photosensitive monomer/(photosensitive monomer + polymer) ≥ 0.86 " as recited in Applicant's Claims 20 and 31.

The Examiner is reminded that when the prior art teaches away from the claimed solution as presented here, obviousness cannot be proven merely by showing that a

known composition could have been modified by routine experimentation or solely on the expectation of success; it must be shown that those of ordinary skill in the art would have had some apparent reason to modify the known composition in a way that would result in the claimed composition. **Ex Parte Whalen II**, Appeal 2007-4423, July 23, 2008.

Further, if the conductive paste composition of Ikeda et al. was modified such that the amount of the polymerizable monomer exceeded 300 weight sections, that is, if the conductive paste composition of Ikeda et al. was modified such that the ratio polymerizable monomer/(polymerizable monomer + binder) exceeded 0.857, then the conductive paste composition would be unsuitable for its intended purpose, because the conductive paste would have a viscosity that would be unsuitable for the paste composition as disclosed in paragraph [0029] of Ikeda et al.

The Examiner is reminded that if the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. In re Gordon, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984) and MPEP § 2143.01.

Even assuming *arguendo* that Ikeda et al. taught or suggested the feature of “photosensitive monomer/(photosensitive monomer + polymer) ≥ 0.86 ” as recited in Applicant’s Claims 20 and 31, Applicant respectfully submits that it would not have been obvious to modify the conductive paste of Ikeda et al. so as to include an increased amount of photopolymerization initiator as allegedly taught by Frechet et al.

Frechet et al. discloses “photoacid generators” as photoactive agents which are used for “cation polymerization” ((see, for example, col.2, lines 44-54 of Frechet et al.). In contrast to Frechet et al., Ikeda et al. discloses a “polyfunctional monomer capable of radical polymerization” (see, for example, the English language Abstract of Ikeda et al.).

One of ordinary skill in the art would recognize that “cation polymerization” is completely different from “radical polymerization,” and that the polymerization initiators used for cation polymerization are completely different from the polymerization initiators

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used for radical polymerization. The Examiner is invited to refer to the following website for a further discussion and explanation of the differences between cation polymerization and radical polymerization: http://www.excite-webtl.jp/world/english/web/?wb_url=http%3A%2F%2Fwww.ushio.co.jp%2Fjp%2Ftechnology%2Ftechnique%2Fcure%2Fcure_03.html&wb_lp=JAEN&wb_dis=2&wb_submit=+%96%7C+%96%F3.

Frechet et al. fails to teach or suggest anything at all about a polymerization initiator used for radical polymerization or that the polymerization initiator disclosed therein could or should be used for radical polymerization. In fact, the polymerization initiator of Frechet et al. used for cation polymerization is completely unsuitable for use for radical polymerization as taught by Ikeda et al. and would not provide the intended function of initiating radical polymerization.

The Examiner is reminded that if the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. In re Gordon, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984) and MPEP § 2143.01.

Thus, contrary to the Examiner's allegations, it would not have been obvious to modify the conductive paste of Ikeda et al. so as to include an increased amount of photopolymerization initiator as allegedly taught by Frechet et al.

Therefore, Applicant respectfully submits that Ikeda et al. and Frechet et al., applied alone or in combination, fail to teach or suggest the unique combination and arrangement of features recited in Applicant's Claims 20 and 31.

Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection of Claims 20 and 31 under 35 U.S.C. § 103(a) as being unpatentable over Ikeda et al. in view of Frechet et al.

The Examiner relied upon Kubota et al., Crary, Broers et al., and Iguchi et al. to allegedly cure deficiencies of Ikeda et al. and Frechet et al. However, Kubota et al., Crary, Broers et al., and Iguchi et al. fail to teach or suggest the feature of

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“photosensitive monomer/(photosensitive monomer + polymer) ≥ 0.86 ” as recited in Applicant’s Claims 20 and 31. Thus, Kubota et al., Crary, Broers et al., and Iguchi et al. clearly fail to cure the deficiencies of Ikeda et al. and Frechet et al. described above.

Accordingly, Applicant respectfully submits that Ikeda et al., Frechet et al., Kubota et al., Crary, Broers et al., and Iguchi et al., applied alone or in combination, fail to teach or suggest the unique combination and arrangement of features recited in Applicant’s Claims 20 and 31.

In view of the foregoing amendments and remarks, Applicant respectfully submits that Claims 20 and 31 allowable. Claims 22-29 and 33-36 depend upon Claims 20 and 31, and are therefore allowable for at least the reasons that Claims 20 and 31 are allowable.

In view of the foregoing amendments and remarks, Applicant respectfully submits that this application is in condition for allowance. Favorable consideration and prompt allowance are solicited.

The Commissioner is authorized to charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 50-1353.

Respectfully submitted,

Dated: March 18, 2010

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